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*Original*

Space-time BIE methods for non homogeneous exteriorwave equation problems. The Dirichlet case / Falletta, Silvia; Monegato, Giovanni; Scuderi, Letizia. - (2010).

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# Space-time BIE methods for non homogeneous exterior wave equation problems. The Dirichlet case. \*

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## Abstract

In this paper we consider the (2D and 3D) exterior problem for the non homogeneous wave equation, with a Dirichlet boundary condition and non homogeneous initial conditions. First we derive two alternative boundary integral equation formulations to solve the problem. Then we propose a numerical approach for the computation of the extra “volume” integrals generated by the initial data. Finally, to show the efficiency of this approach, we solve some test problems by applying a second order Lubich discrete convolution quadrature for the discretization of the time integral, coupled with a collocation first, and a Galerkin then, boundary element method.

KEY WORDS: wave equation; non homogeneous conditions; space-time boundary integral equations; numerical methods

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\*This work was supported by the Ministero dell’Istruzione, dell’Università e della Ricerca of Italy, under the research program PRIN07: Boundary element methods for time-dependent problems.

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